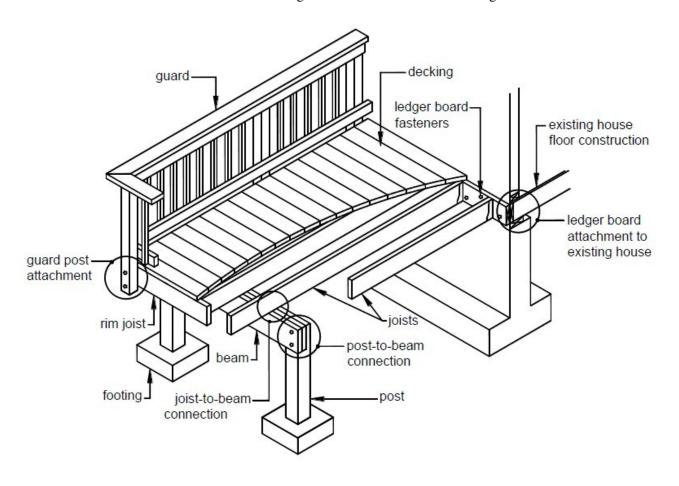
## **Stafford County**

# Typical Deck Details

Based on the 2009 Virginia Uniform Statewide Building Code



General Requirements2	Prohibited Ledger Attachments	9
Decking2	Ledger Board Fasteners	
Joists3	Framing at Chimney or bay Window	.11
Beams4	Lateral Support	.12
Length to width Ratio5	Free-Standing Decks.	.14
Joist-to-Beam Connections5	Guards	.14
Posts6	Guard Post Assemblies.	15
Footings7	Stair	1′
Ledger Attachments7	Safety Glazing.	.22

These standards apply to single span, single level residential decks only. Decks are to be constructed in accordance with this policy. This document must be on site for inspection at all times.

## **GENERAL REQUIREMENTS**

- Lumber shall be southern pine #2 or better and shall be preservatively treated in accordance with AWPA U1. Lumber that rests on ground must bear a label that indicates "ground contact."
- Wood-plastic composites are composed of bound wood and plastic fibers creating material that can be used as decking and guard elements. Such composites must bear a label indicating performance and compliance with ASTM D 7032.
- Fasteners must be hot dipped galvanized, stainless steel or approved for use with the wood preservative that is utilized.
- Joist hangers, post bases, straps and other connectors must be galvanized with 1.85 oz. per square foot of zinc or shall be stainless steel.

- Decks greater than 20 SF shall have an electrical outlet along the perimeter of the deck and within 6'-6" of surface. This requirement does not apply to decks attached to existing structures.
- Privacy screens, trellises, hot tubs, flower boxes and built in seating are not permitted in accordance with these details.
- When using this policy a scaled sketch must be included that details: floor joist, beam, cantilever and footing (sizes, locations and lengths). The deck's location relative to the structure must be indicated. A scaled sketch on graph paper will satisfy this requirement.

## **DECKING**

## **Approved Material**

- Wood-plastic composite label and manufacturer's instructions must be left on the jobsite for inspector verification.
- Dimensions shall be 2x6 or <sup>5</sup>/<sub>4</sub> ("five-quarter") for wood and per manufacturer for wood-plastic composites.
- Wood decking may be placed at an angle of 45 to 90 degrees to the joists. Attach wood decking in accordance with FIGURE 1.
- Placement and attachment of wood-plastic composites shall be in accordance with manufacturer's installation instructions.
- Wood-plastic composite label and munufacturer's specifications must be left on the job site for inspector verification.

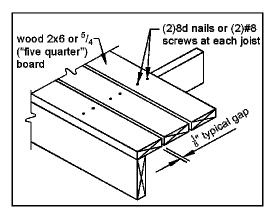


FIGURE 1: TYPICAL DECKING

## Plastic Decking

Plastic or PVC decking, not considered a wood-plastic composite, may be substituted only when the product has a valid evaluation report from an accredited listing agency and is capable of resisting a live load of 40 PSF. Installation shall be in conformance to the evaluation report and the manufacturer's installation instructions which must be available to the inspector.

## **JOISTS**

Joists shall be designed in accordance with the requirements below.

- Joist span is measured between the centerline of bearing at each end of the joist and does not include the overhangs.
- See FIGURE 2 through FIGURE 4 for joist span types.
- Use **TABLE 1** to determine your joist size based on span length and spacing.
- The maximum overhang is equal to one-fourth of the length of the joist span (0.25 x joist span).
- Attach rim joist to end of joists as shown in **FIGURE 2** and **FIGURE 4**.

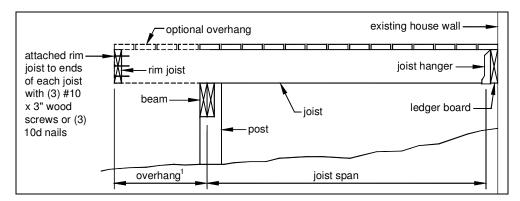


FIGURE 2: JOIST SPAN WITH OVERHANG - DECK ATTACHED AT HOUSE

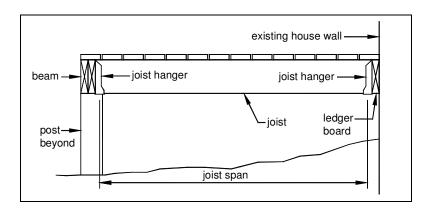


FIGURE 3: JOIST SPAN WITH OVERHANG - JOISTS ATTACHED TO SIDE OF BEAM

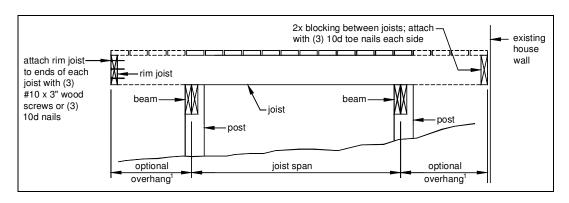


FIGURE 4: JOIST SPAN – FREE STANDING DECK

 $<sup>^{1}</sup>$ The maximum length of the overhang is equal to one-fourth of the joist span length (.25 x joist span).

<sup>&</sup>lt;sup>2</sup>See sheet 15 for more information on free-standing decks.

#### TABLE 1: MAXIMUM JOIST SPAN LENGTH

## JOISTS WITHOUT OVERHANGS

## JOISTS WITH OVERHANGS

Joist Spacing→	12"	16"	24"
Joist Size <b>↓</b>			
2x8	13'-8"	12'-5"	10'-2"
2x10	17'-5"	15'-10"	13'-1"
2x12	18'-0"	18'-0"	15'-5"

Joist Spacing→	12"	16"	24"
Joist Size <b>↓</b>			
2x8	10'-6"	10'-6"	10'-2"
2x10	15'-2"	15'-2"	13'-1"
2x12	18'-0"	18'-0"	15'-5"

Spans are based on 40 PSF live load, 10 PSF dead load, southern pine #2, normal loading duration, wet service conditions and deflections of Δ=ℓ/360 for main span and ℓ/180 for overhang.

## **BEAMS**

Beams shall be designed and assembled in accordance with the requirements below.

- As shown in FIGURE 5 beam span is measured between the centerlines of two adjacent posts.
- Beam size is determined using TABLE 1.
- Beams may overhang each end up to one-fourth of the beam span (0.25 x beam span) as shown in FIGURE 5.
- Using the members identified in TABLE 1, beams shall be assembled in accordance with FIGURE 6.
- Beam splices shall be located over interior post locations only.

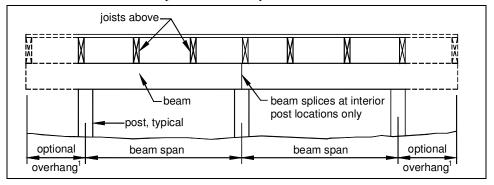


FIGURE 5

 $^{1}$ The maximum length of the overhang is equal to one-fourth of the beam span length (0.25 x beam span).

## TABLE 1: MAXIMUM BEAM SPAN LENGTH<sup>1</sup>

			11111111	I DELIVIT	71 111 ( 1313)	10111		
Beam Size→ Joist Span <b>↓</b>	(2)2x6	(2)2x8	(2)2x10	(2)2x12	(3)2x6	(3)2x8	(3)2x10	(3)2x12
≤ 6'	7'-1"	9'-2"	11'-10"	13'-11"	8'-7"	11'-4"	14'-5"	17'-5"
> 6' - 8'	6'-2"	7'-11"	10'-3"	12'-0"	7'-8"	9'-11"	12'-10"	15'-1"
> 8' - 10'	5'-6"	7'-1"	9'-2"	10'-9"	6'-11"	8'-11"	11'-6"	13'-6"
> 10' - 12'	5'-0"	6'-6"	8'-5"	9'-10"	6'-3"	8'-1"	10'-6"	12'-4"
> 12' - 14'	4'-8"	6'-0"	7'-9"	9'-1"	5'-10"	7'-6"	9'-9"	11'-5"
> 14' - 16'	4'-4"	5'-7"	7'-3"	8'-6"	5'-5"	7'-0"	9'-1"	10'-8"
> 16' - 18'	4'-1"	5'-3"	6'-10"	8'-0"	5'-2"	6'-7"	8'-7"	10'-1"

Spans are based on 40 PSF live load, 10 PSF dead load, southern pine #2, normal loading duration, wet service conditions and deflections of  $\Delta$ = $\ell$ /360 for main span and  $\ell$ /180 for overhang with a 230 lb. point load.

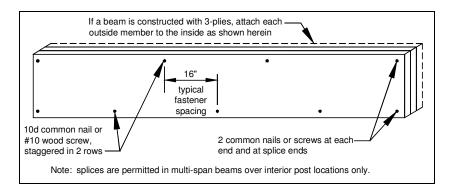
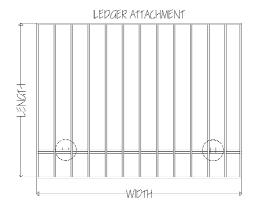


FIGURE 6

## LENGTH TO WIDTH RATIO

#### Length to Width Ratio

For decks attached to the existing house only, the length cannot be greater than 2x the width of the deck. Refer to illustration at right to determine length from width. When these proportions are exceeded it creates excessive stresses on the outer edges of the band board.



## JOIST-TO-BEAM CONNECTION

Each joist shall be attached to the beam as shown in

## FIGURE 1

. Use Option 1 or Option 2 when joists bear on or overhang past the beam as shown in FIGURE 2 AND FIGURE 4. Use Option 3 when joists attach to the side of the beam as shown in FIGURE 3. however, the joist depth must be less than or equal in depth to the beam depth. See <u>Joist Hangers</u> below for information on hanger requirements. Mechanical fasteners or hurricane clips used in Option 2 shall have a minimum capacity of 100 lbs. in both uplift and lateral load directions. See manufacturer's instructions for minimum installation requirements.

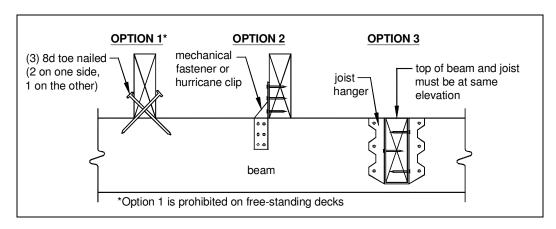


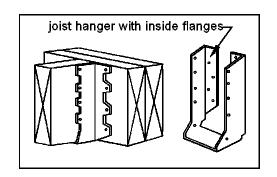
FIGURE 1

## JOIST HANGERS

oist hangers, as shown in FIGURE 1, shall have a minimum capacity of 600 lbs. for 2x8s, 700 lbs. for 2x10s and 800 lbs. for 2x12s. The joist hanger shall be designed and manufactured for the number of plies it is carrying.

Use joist hangers with inside flanges when clearances to the edge of the beam or ledger board dictate.

Do not use clip angles or brackets to support framing members. Do not bend hanger flanges to accommodate field conditions.



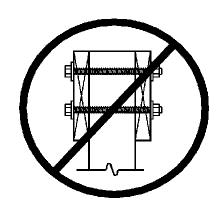
## **POSTS**

Deck posts shall be 6x6 with a maximum height of 14'-0" measured from the top of the footing to the underside of the beam. The beam shall be attached to the post by one of the methods shown in

FIGURE 3. The attachment condition shown in FIGURE 2 is prohibited.

The post cap shown in FIGURE 4, Option 2 shall be specifically designed for two- or three-ply beams and 6x6 posts with a minimum downward allowable load capacity of 5,000 lbs. Attachment shall be per manufacturer's instructions. Post caps shall be galvanized per the requirements noted on Sheet 2.

Cut ends of posts shall be field treated with a wood preservative containing <u>copper naphthenate</u>. Such products can be found in the paint department of most hardware or home center stores.



**FIGURE 2: PROHIBITED** 

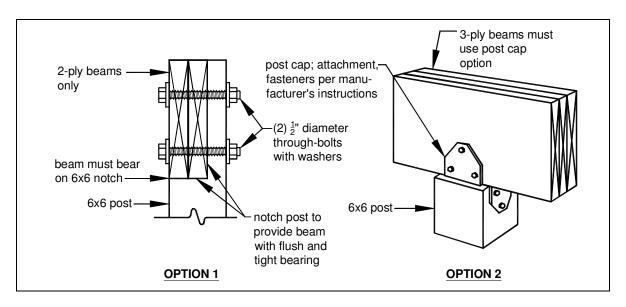


FIGURE 3: POST-TO-BEAM CONNECTION OPTIONS

## **FOOTINGS**

Footings shall be constructed in accordance with the requirements below.

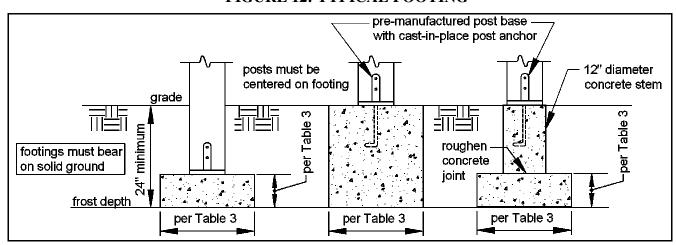
- Concrete shall be air-entrained and have a minimum compressive strength of 3,000 PSI.
- Footing size and thickness shall be in accordance with TABLE 3.
- See FIGURE 12 for post attachment options and requirements.
- Post anchors shall be galvanized per the requirements noted on Sheet 2.
- Footings shall bear on solid ground; bearing conditions must be verified by county inspectors prior to placement of concrete.
- Deck footings closer than 5'-0" to an existing exterior house wall must bear at the same elevation as the existing house footings.
- Do not construct footings over utility lines or service pipe. Call Miss Utility at 811 before you dig.

**TABLE 3: FOOTING SIZES** 

Beam Span	Joist Span	Size of Square	Size of Round	Minimum Thickness <sup>1</sup>	
	≤ 10'	15"	17"	6"	
≤ 8'	>10' - 14'	18"	20"	8"	
	>14' - 18'	21"	23"	9"	
	≤ 10'	19"	21"	8"	
> 8' ≤ 12'	>10' - 14'	22"	24"	10"	
	>14' - 18'	26"	28"	11"	
>12' ≤ 17'	≤ 10'	23"	25"	10"	
	>10' - 14'	28"	30"	12"	

<sup>&</sup>lt;sup>1</sup>The cast-in-place post base may require a footing thickness greater than the value in the table above. In such cases, the manufacturer's specified minimum footing thickness shall govern.

FIGURE 12: TYPICAL FOOTING



## LEDGER ATTACHMENTS

Ledger boards shall be attached to the existing house in accordance with the requirements below.

- The depth of a ledger board shall be greater than or equal to the depth of the joists.
- The attachments shall be in accordance with FIGURE 5 through FIGURE 6.
- The band board of the existing structure shall be capable of supporting the new deck. If this cannot be verified or conditions at the existing house differ from the details herein, then a free-standing deck is required. See <u>Free-Standing Decks</u> on Sheet 14
- Compliance with all the requirements herein is critical to ensure the safety and structural stability of your deck.

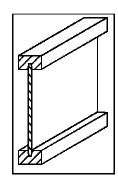
#### Siding and Flashing

Flashing shall be installed in accordance with the requirements below.

- The exterior finish, i.e., house siding, must be removed prior to the installation of the ledger board.
- Continuous flashing with a drip edge, as shown in FIGURE 5, is required at the ledger board when connected to a wood band board.
- Flashing shall be composed of copper (attached using copper nails only), stainless steel, UV resistant plastic or galvanized steel coated with 1.85 oz/sf of zinc (G-185 coating).
- Flashing at a door threshold shall be installed so as to prevent water intrusion from rain or melting ice and snow.

#### Wood I-Joists

Many homes constructed with wood I-joists, as shown at right, have a 1" or thicker engineered wood product (EWP) band board capable of supporting a deck; see FIGURE 4. If a minimum 1" EWP or 2x band board is not present, then a free-standing deck is required. See *Free-Standing Decks* on Sheet 14.



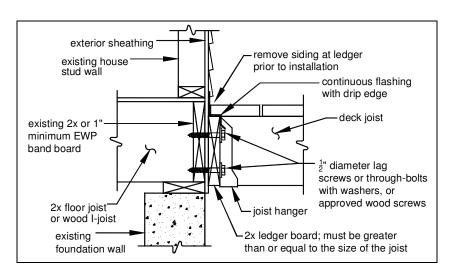


FIGURE 4: ATTACHMENT OF LEDGER BOARD-TO-BAND BOARD

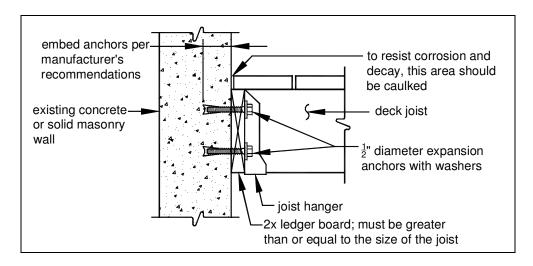


FIGURE 5: ATTACHMENT OF LEDGER BOARD-TO-FOUNDATION WALL (CONCRETE OR SOLID MASONRY)

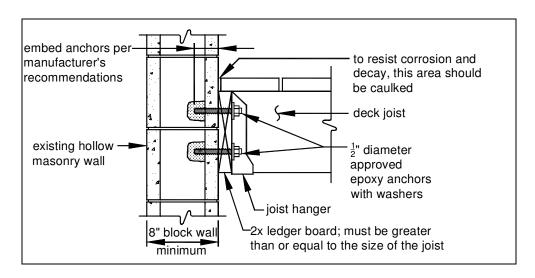
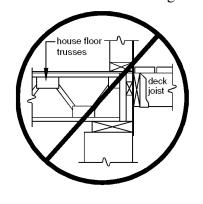


FIGURE 6: ATTACHMENT OF LEDGER BOARD-TO-FOUNDATION WALL (HOLLOW MASONRY)

## PROHIBITED LEDGER ATTACHMENTS

The ledger board attachment conditions shown in FIGURES 17-19 below are strictly prohibited. In such cases the deck shall be free-standing. See FREE-STANDING DECKS on Sheet 14.



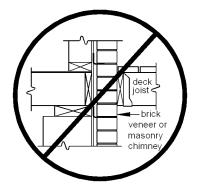




FIGURE 18: BRICK VENEER

## LEDGER BOARD FASTENERS

Ledger board fasteners shall be installed in accordance with FIGURE 7 and the on center spacing in

TABLE 2. Only those fastener types noted herein are approved for use. Adequacy of connections will be verified by county inspectors.

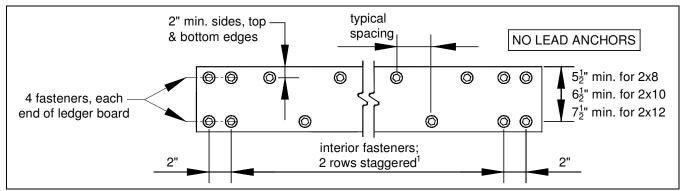


FIGURE 7: LEDGER BOARD FASTENER SPACING AND CLEARANCES

TABLE 2: LEDGER BOARD FASTENER SPACING, ON CENTER

	Joist Span→	≤6'	>6'-8'	>8'-10'	>10'-12'	>12'-14'	>14'-16'	>16'-18'
Fastener♥	Band Board <b>↓</b>							
Lag Screws	EWP <sup>1</sup>	24"	18"	14"	12"	10"	9"	8"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
Through Bolts	EWP <sup>1</sup>	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	34"	29"	24"	21"	19"
Approved Wood Screws <sup>2</sup>	1" EWP <sup>1</sup>	18"	13"	11"	9"	8"	7"	6"
	2x lumber	19"	14"	11"	9"	8"	7"	6"
Expansion Anchors	-	36"	36"	34"	29"	24"	21"	19"
Approved Epoxy Anchors	-	32"	32"	32"	24"	24"	16"	16"

EWP = 1" minimum manufactured engineered wood product; see Sheet 8 for more information.

#### Through-Bolts

Through-bolts shall have a minimum diameter of  $^{1}/_{2}$ ". Pilot holes for through-bolts shall be  $^{17}/_{32}$ " to  $^{9}/_{16}$ " in diameter. Through-bolts must be equipped with washers at the bolt-head and nut.

#### Expansion Anchors

Use expansion anchors when attaching a ledger board to a concrete or solid masonry wall as shown in FIGURE 5. Bolt diameters of the anchors shall be a minimum of  $^{1}/_{2}$ "; in some cases, this may require an anchor size of  $^{5}/_{8}$ ". Expansion anchors must be installed in accordance with manufacturer's specifications.

Additional interior fasteners are required at chimney or bay window; see FIGURE 9.

<sup>&</sup>lt;sup>2</sup> Wood screws shall be permitted to be spaced according to the product's valid and current ICC-ES evaluation report.

#### **Epoxy Anchors**

When attaching to concrete, solid masonry or hollow masonry, use one of the approved epoxy anchors listed in TABLE 3 with a minimum diameter of <sup>1</sup>/<sub>2</sub>". Installation shall be in conformance to the manufacturer's instructions and as shown in FIGURE 6 for hollow masonry. **Epoxy cartridges must remain on the jobsite until inspector approval.** 

TABLE 3: APPROVED EPOXY ANCHORS

Manufacturer	Product
ITW Ramset/Red Head	Epcon Acrylic 7
Hilti	HY-20

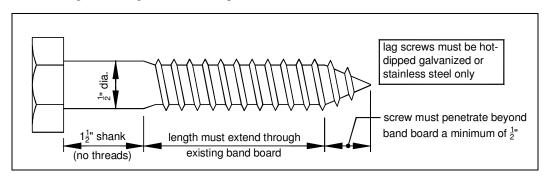
#### Lag Screws

Lag screws shall be installed in accordance with the requirements below.

- The minimum diameter shall be  $\frac{1}{2}$ ".
- Lag screws shall be hot-dipped galvanized or stainless steel.
- Lag screws may be used only when the field conditions match those shown in

FIGURE 4.

• See FIGURE 8 for lag screw length and shank requirements.



## FIGURE 8: LAG SCREW REQUIREMENTS

- Lag screws shall be installed with washers.
- Each lag screw shall have pilot holes drilled as follows:
  - 1) Drill a  $\frac{1}{2}$ " diameter hole in the ledger board
  - 2) Drill a <sup>5</sup>/<sub>16</sub>" diameter hole into the solid connection material of the existing house; **do not drill a <sup>1</sup>/<sub>2</sub>" diameter hole**.
- The threaded portion of the lag screw shall be inserted into the pilot hole by turning. **Do not drive with a hammer**.
- Use soap or a wood-compatible lubricant as required to facilitate tightening.
- Each lag screw shall be thoroughly tightened snug, but shall not be overly tightened so as to cause wood damage.

#### **Wood Screws**

Use the wood screws listed in TABLE 4 with a  $\frac{1}{4}$ " diameter and a sufficient length to fully penetrate the existing house band board. Installation shall be in conformance with the manufacturer's instructions.

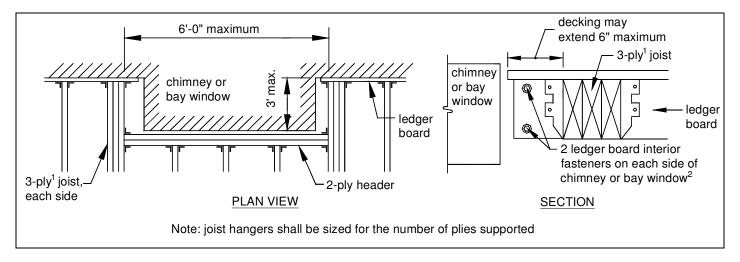
**TABLE 4: APPROVED WOOD SCREWS** 

Manufacturer	Product
FastenMaster	LedgerLok
Simpson Strong-Tie	Strong-Drive Screws (SDS, SDW)

## FRAMING AT CHIMNEY OR BAY WINDOW

All framing at a chimney or bay shall be constructed in accordance with FIGURE 9 and the requirements below.

- Header size shall be equal to the joist size.
- When the chimney or bay window is deeper than 3'-0", install a 6x6 post with footing per the requirements on Sheet 8 below each triple joist at the location of the header connection.
- When the header is longer than 6'-0", install 6x6 posts with footing per the requirements on Sheet 7 below the header to reduce the span to less than 6'-0".
- Post footings must meet the requirements on Sheet 7.
- Joist hangers shall be specifically designed to accommodate the number of members identified in FIGURE 9.



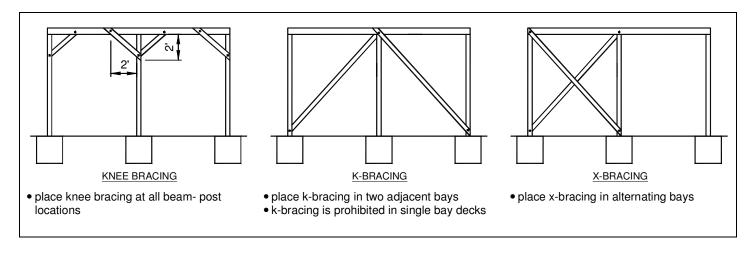
#### FIGURE 9: REQUIREMENTS FOR FRAMING AT CHIMNEY OR BAY WINDOW

- May be reduce d to 2-ply joists if joist spacing = 24" on center, joist span  $\le 8$ '-6" or chimney/bay window depth  $\le 18$ ".
- Fasteners adjacent chimney/bay window are considered interior to the ledger board. See FIGURE 7 for fasteners requirements at the end of the ledger board.

## LATERAL SUPPORT

<u>All</u> decks greater than 4'-0" above grade shall resist lateral loading by providing diagonal bracing as shown in FIGURE 10 and in accordance with the following:

- Diagonal bracing shall be 2x4 minimum.
- Decks shall have diagonal bracing installed at beam locations.
- Free-standing decks shall also have diagonal bracing installed parallel to joists at each post location in accordance with FIGURE 11.
- Only one type of diagonal bracing shall be provide in each beam line as identified in FIGURE 10 and each joist line as identified in FIGURE 11.
- Connection of diagonal bracing shall be in accordance with FIGURE 13.



# FIGURE 10: DIAGONAL BRACING AT BEAM-POST LOCATIONS (all decks)

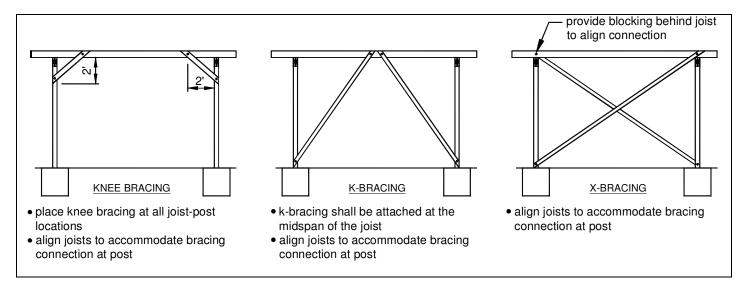


FIGURE 11: DIAGONAL BRACING AT JOISTS-POST LOCATIONS (free-standing decks only)

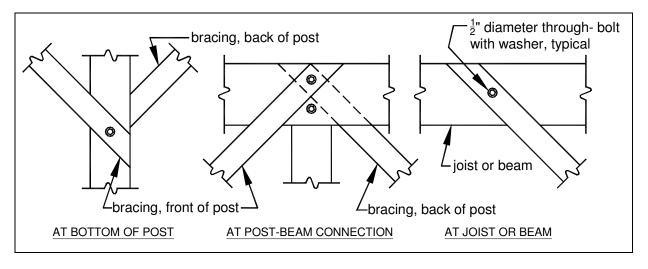


FIGURE 12: TYPICAL CONNECTIONS OF DIAGONAL MEMBERS

## FREE STANDING DECKS

Decks which are free-standing do not utilize the exterior wall of the existing house to support vertical loads. Instead, an additional beam with posts is provided at or offset from the existing house; see FIGURE 14. When the edge of the deck footings are closer than 5'-0" to an existing exterior house wall, it must bear at the same elevation as the existing house footings, see FIGURE 13 below. Beam size is determined by TABLE 1.

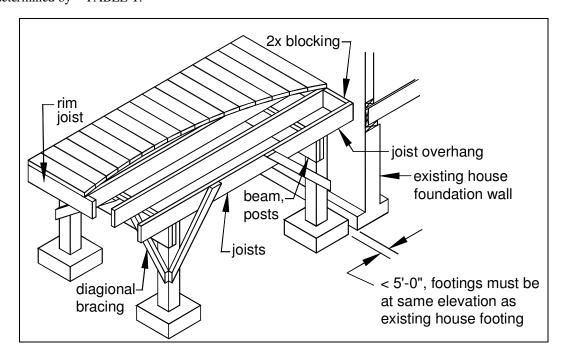


FIGURE 13: FREE-STANDING DECK

#### **GUARDS**

Guards, whether required or not, shall be constructed in accordance with the requirements on the proceeding pages and figures. Deviations are prohibited.

#### When Required

When a deck is greater than 30" above grade at a point 36" from the edge of the deck, as shown in FIGURE 27, a guard is required.

## **Wood-Plastic Composites**

Wood-plastic composites of the same dimensions and complying with the criteria noted on Sheet 2, may be substituted for the guard rail-cap and infill elements shown in FIGURE 14 provided the manufacturer's performance criteria specifically allow it.

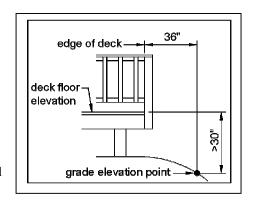


FIGURE 27: WHEN GUARD IS REQUIRED

#### **Guard Systems**

Pre-fabricated systems composed of wood, wood-plastic composites or plastic purchased from a home center store, lumber company or similar will require a plan submission during the permit application process. Only guard systems with a valid evaluation report from an accredited listing agency will be approved for installation.

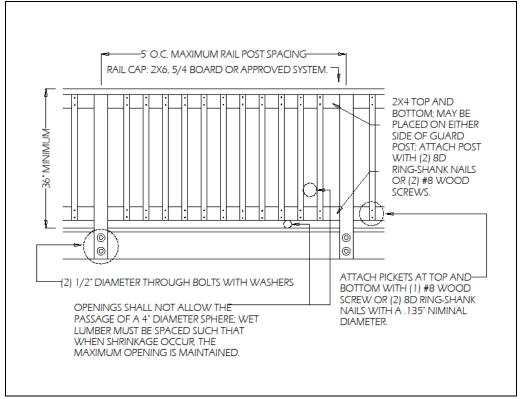


FIGURE 14: TYPICAL GUARD DETAIL

#### **GUARD POST ATTACHMENTS**

To ensure that the guard rail system is strong enough to support stresses that can be imposed by large gatherings of people leaning, impacting or otherwise stressing the guard assembly the following details MUST be observed:

- No notching of guard posts permitted as illustrated in FIGURE 29.
- Rail post spacing must not exceed 5' O.C. (Unless an ICC ESR proprietary system permits otherwise).
- Bolting the rail posts must be in accordance with FIGURE 30.
- Install Simpson SP2 (or structural equivalalent) at every other joist-to-band connection as in FIGURE 31.
- Connect deck board to joists and band as illustrated in FIGURE 32.
- Connect joist to band as illustrated in FIGURE 32.
- Block joists according to FIGURE 33.



FIGURE 30: GUARD POST ATTACHMENT

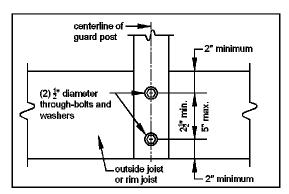


FIGURE 31: STUD PLATE TIES

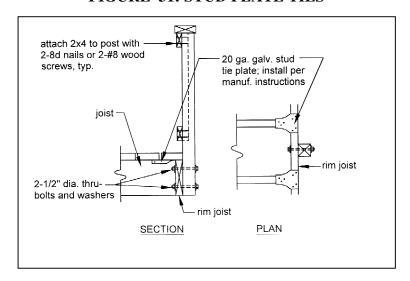


FIGURE 32: DECK/BAND BOARD ATTACHMENT

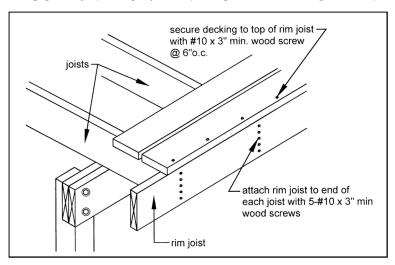
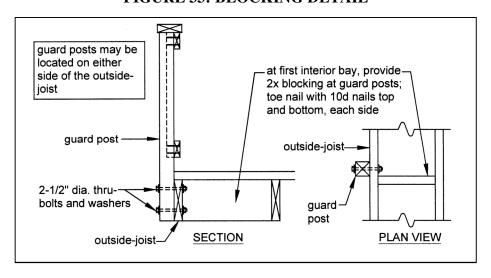


FIGURE 33: BLOCKING DETAIL



## **STAIRS**

#### Stair Geometry

Stairs shall be a minimum of 36" in width as shown in FIGURE 21. Tread, riser and nosing dimensions, opening limitations and tolerance minimums shall meet the requirements shown in FIGURE 16.

#### Tread & Riser Material

Tread and riser material shall be in accordance with the requirements below.

- Tread material shall be equivalent to decking as specified on Sheet 2.
- Wood-plastic composites may not have capacity for stair treads equal to their wood equivalents.
- 2x wood material shall be used on 36" wide stairs framed with two stringers only. See Sheet 17 for more information.
- Tread material shall be attached per FIGURE 17.
- Risers may be framed with 1x lumber minimum or equivalent wood-plastic composite.

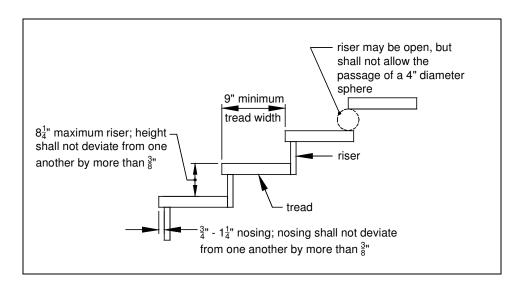


FIGURE 16: TREAD AND RISER DETAIL

#### Stair Stringers

Stringers shall be constructed in accordance with the following requirements.

- Stringers shall be sawn or solid 2x12s meeting the stair geometry requirements shown in FIGURE 16.
- Attach stringers to the deck per FIGURE 18 OR 18A.
- Stringers shall be spaced at a maximum of 18" on center. However, stairs with a width equal to 36" may be constructed with two stringers provided the treads are comprised of wood 2x material only.
- Measured horizontally, the maximum horizontal stringer spans shall not exceed the lengths shown in FIGURE 17.
- Stringers with long spans may be supported with 4x4 posts along their length to create multiple compliant spans. The 4x4 post shall be notched and bolted to the stringer with (2)  $^{1}/_{2}$ " diameter through-bolts with washers per FIGURE 4, Option 1. The post shall be centered on a 10" diameter or 8" square, 4" thick footing 12" below grade and be attached per FIGURE 25.
- Intermediate landings may also be provided to shorten the stringer span; see <u>Stair Landings</u> on Sheet 19.

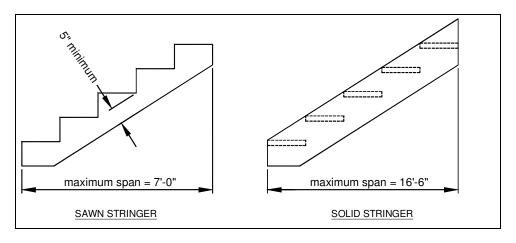


FIGURE 17

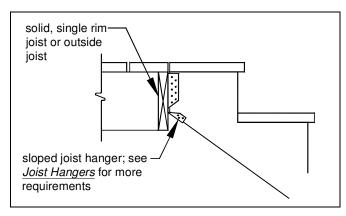


FIGURE 18

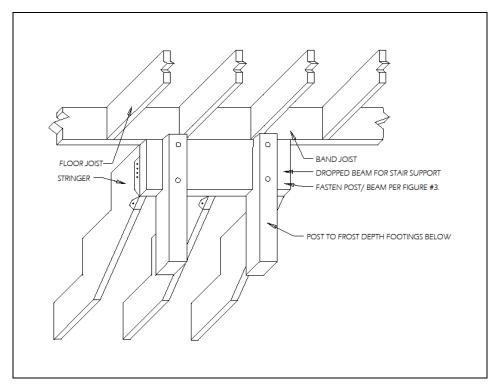


FIGURE 18A

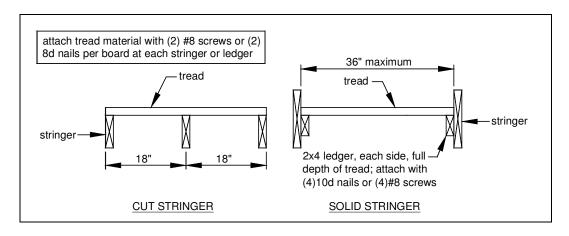


FIGURE 17: TREAD CONNECTION REQUIREMENTS

#### Stair Landings

If the total vertical height of a stairway exceeds 12'-0", then an intermediate landing will be required. Intermediate stair landings shall be designed and constructed as a free-standing deck using the details herein. However, for stair landings only, 4x4 posts may be used in lieu of 6x6 posts for heights less than or equal to 7'-0". Every landing shall have a minimum dimension of 36" measured in the direction of travel and not less than the width of the stairways served.

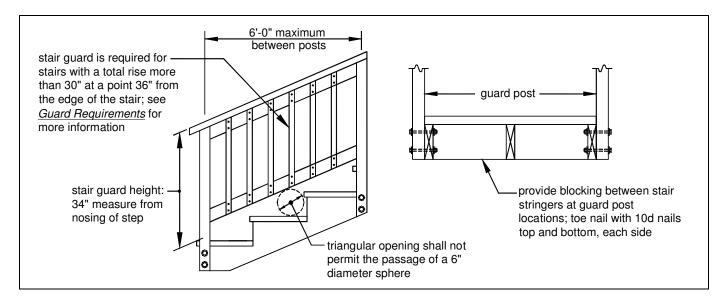


FIGURE 18: STAIR GUARD REQUIREMENTS

#### Stair Handrails

Handrails shall be constructed in accordance with the following requirements.

- Stairs with four or more risers shall have a handrail on one side.
- Handrails shall be graspable per FIGURE 19.

- Handrail and connecting hardware material shall be decay-resistant and/or corrosion resistant.
- Handrail shall be attached to the stair guard or an existing exterior wall which acts as a barrier to the stairs. See
- FIGURE 4020.
- All shapes shall have a smooth surface with no sharp corners.
- Recessed sections may be shaped from a 2x6 or <sup>5</sup>/<sub>4</sub> board.
- Handrails shall run continuously from a point directly over the lowest riser to a point directly over the highest riser and shall return to the guard at each end; see FIGURE 21. Handrails may be interrupted by guard posts only at a turn in the stair.

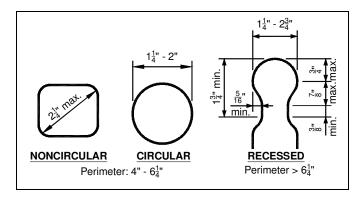


FIGURE 19: HANDRAIL GRASPABILITY TYPES/GEOMETRY

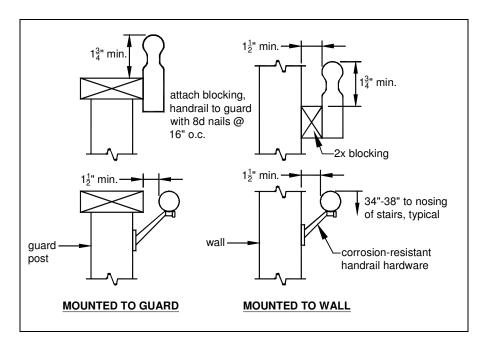


FIGURE 4020: HANDRAIL REQUIREMENTS

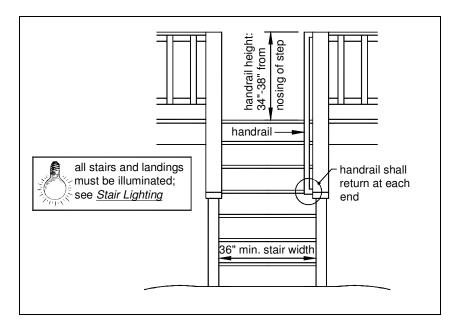


FIGURE 21: MISCELLANEOUS STAIR REQUIREMENTS

#### Stair Lighting

Stairways shall have a light source located at the top landing such that all stairs and landings are illuminated. Lights shall be operated from switches inside the house, motion detectors or timed switches.

## Stair Stringer Footings

Stair stringers at grade shall bear on a concrete footing as shown in

**FIGURE** 

**22**FIGURE 24. The footings for each stringer may be combined and poured as a 12" deep slab.

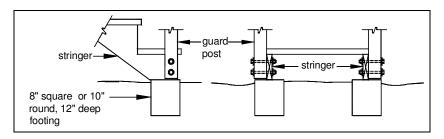


FIGURE 22: STAIR STRINGER FOOTING

## **SAFETY GLAZING**

To reduce injury due to an accidental impact, safety glazing in window and door glass is required when the existing house wall encloses any portion of the deck or acts as a barrier to adjacent stairs, landings and the areas at the top and bottom of the stairs. Glazing shall be located in the affected panes of the areas identified below.

- Adjacent surface of deck: individual panes wholly located in the area identified in FIGURE 23 with a total pane area greater than 9 sf.
- Adjacent stairway: individual panes partially or wholly located in the area shown in FIGURE 24.

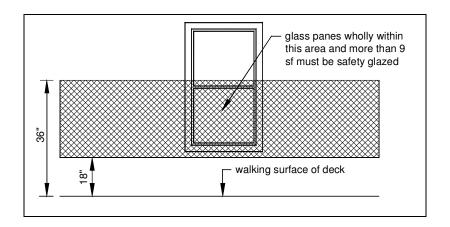


FIGURE 23: SAFETY GLAZING AREA AT WALKING SURFACE

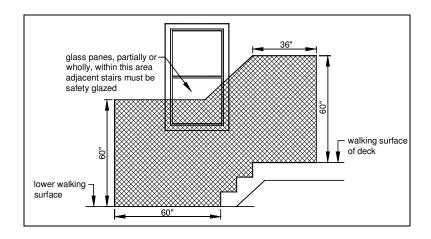


FIGURE 24: SAFETY GLAZING AREA AT STAIRS